

Chapter II

Historical overview

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The once lush tropical rainforests of the Philippines have experienced extensive deforestation and degradation over the last century (Pulhin 2003). Simultaneously, small-scale forest rehabilitation¹ efforts have been ongoing since around 1910. Traditionally, government and private companies initiated and implemented rehabilitation activities, but since the mid 1970s international funding began to play a role and many different sectors became involved. Recent projects vary widely in terms of key actors, scale, major objectives, approaches and duration. For instance, projects range from large-scale, government-driven watershed reforestation to small-scale plantations established by non-government organisations (NGOs) and/or peoples' organisations (POs). They also include private individual or company plantations, local government unit (LGU)-initiated plantations, or those established by government agencies outside the forestry sector. More than US\$570 million has been spent since the mid 1970s.

¹ See Chapter I for details on rehabilitation terminology.

This chapter provides a broad historical overview of forest rehabilitation in the Philippines and the driving forces and outcomes, as could be synthesised and inferred from the secondary data and literature available at the national level. Much of the information available was in the form of grey literature such as project reports. Larger rigorous empirical studies on outcomes and causal factors for government rehabilitation projects and various non-governmental initiatives are scarce. Forestry Sector Project I (FSP I) and to a lesser extent Forestry Sector Project II (FSP II), have some information on outcomes.

1. Biophysical and socio-economic characteristics

The Philippines is an archipelago of 7107 islands with a total land area of around 30 million ha. The country is divided into 17 administrative regions, divided into 79 provinces, 115 cities, 1499 municipalities and 41,969 *barangays*² (Figure 1). Luzon and Mindanao islands occupy about 35 and 32 percent respectively of the total land area (Garrity *et al.* 1991), and, in 2000, contained 80 percent of its 76.5 million citizens (Pro Style Grafix 2004).

Much of the Philippines is hilly and mountainous (Figure 2), with 52 percent of the land area, or 15.8 million ha, officially classified as “forest land”, administered by the DENR (FMB 2002)³. Most of this land has slopes ≥ 18 percent. Forest lands cannot be certified as “alienable and disposable”⁴ and will remain part of the nation’s permanent public forest estate according to Section 15 of the Revised Forestry Code of 1975.

The climate is humid tropical and rainfall is generally abundant. Only 10 percent of the country receives less than 178 cm per year (Garrity *et al.* 1991). Mean temperature in the Philippines excluding Baguio City is 26.6°C (www.pagasa.dost.gov.ph/cab/statfram.htm). Temperature differences are mostly due to variations in elevation, ranging from 8°C in Baguio City at 1500 m above sea level to 30.8°C in Jolo province at sea level. Garrity *et al.* (1991) noted that the Philippines has comparatively favourable soils for a tropical country. Thanks to the soil’s relatively young age, and volcanic, limestone, or alluvial origin, they are generally not too weathered. However, steep slopes, high precipitation, and frequent, extremely heavy rainfall over short periods due to typhoons cause serious soil erosion in some places.

² Barangay - the smallest political unit in the Philippines and often corresponds to a village or town district.

³ The term “forest land” refers to all property owned by the national government that is still in the public domain. It is a legal, not a botanical description. In reality, much “forest land” does not contain forests.

⁴ Alienable and disposable lands refer to lands that have been officially classified as not needed for forest purposes. They are open for conversion to alternative use.

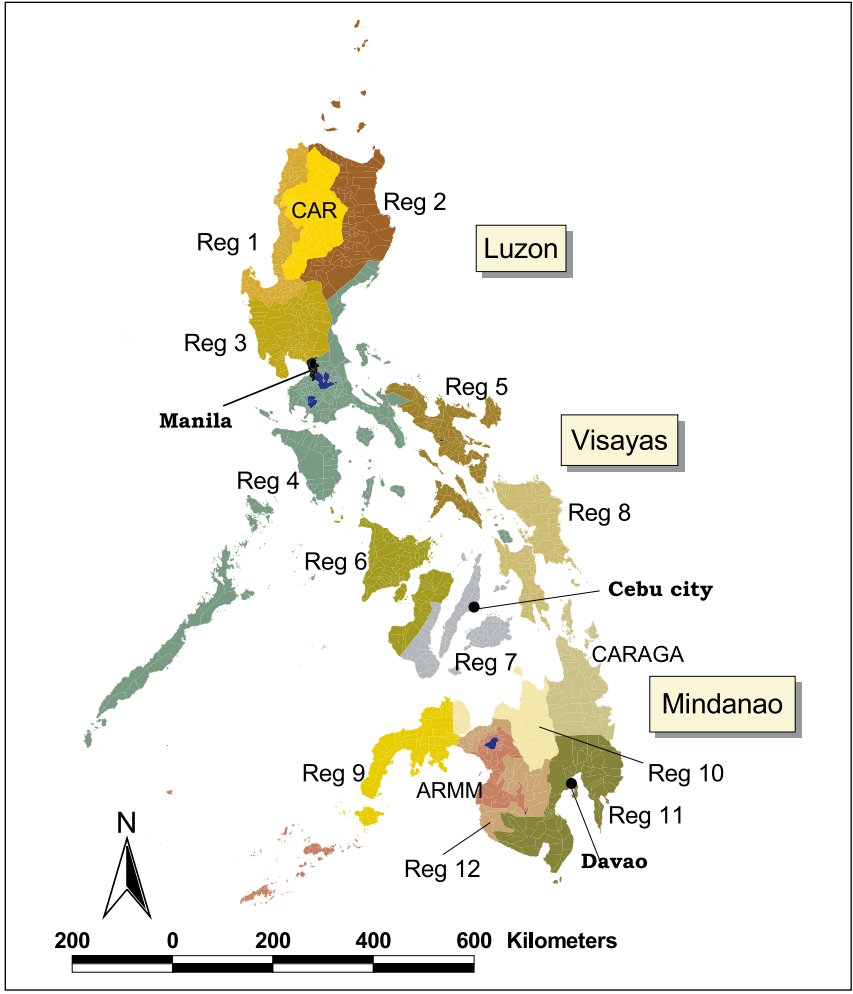


Figure 1. Administrative regions of the Philippines
 Data source: Center for International Earth Science Information Network

Sajise (1998) estimated that more than 20 million people live in the uplands, with around 11 million residing within the official forest lands⁵ (Cruz *et al.* 1992). Most are totally or partially dependent on forest lands and resources for their livelihood and are among the “poorest of the poor” (FDC 1985, World Bank 1989). The population falls into two classes: indigenous and migrant. The indigenous groups, comprising more than five million people, invoke ancestral rights to the land (Contreras 1991). They have lived there for generations, and traditionally practiced long-rotation swidden agriculture locally called *kaingin*.

⁵ Cruz estimated 11 million people in a 1986 study by counting only the population of the 69 percent of the upland municipalities that lie entirely within mountainous areas. She further discounted for an estimated 25 percent of urban and other alienable and disposable land.

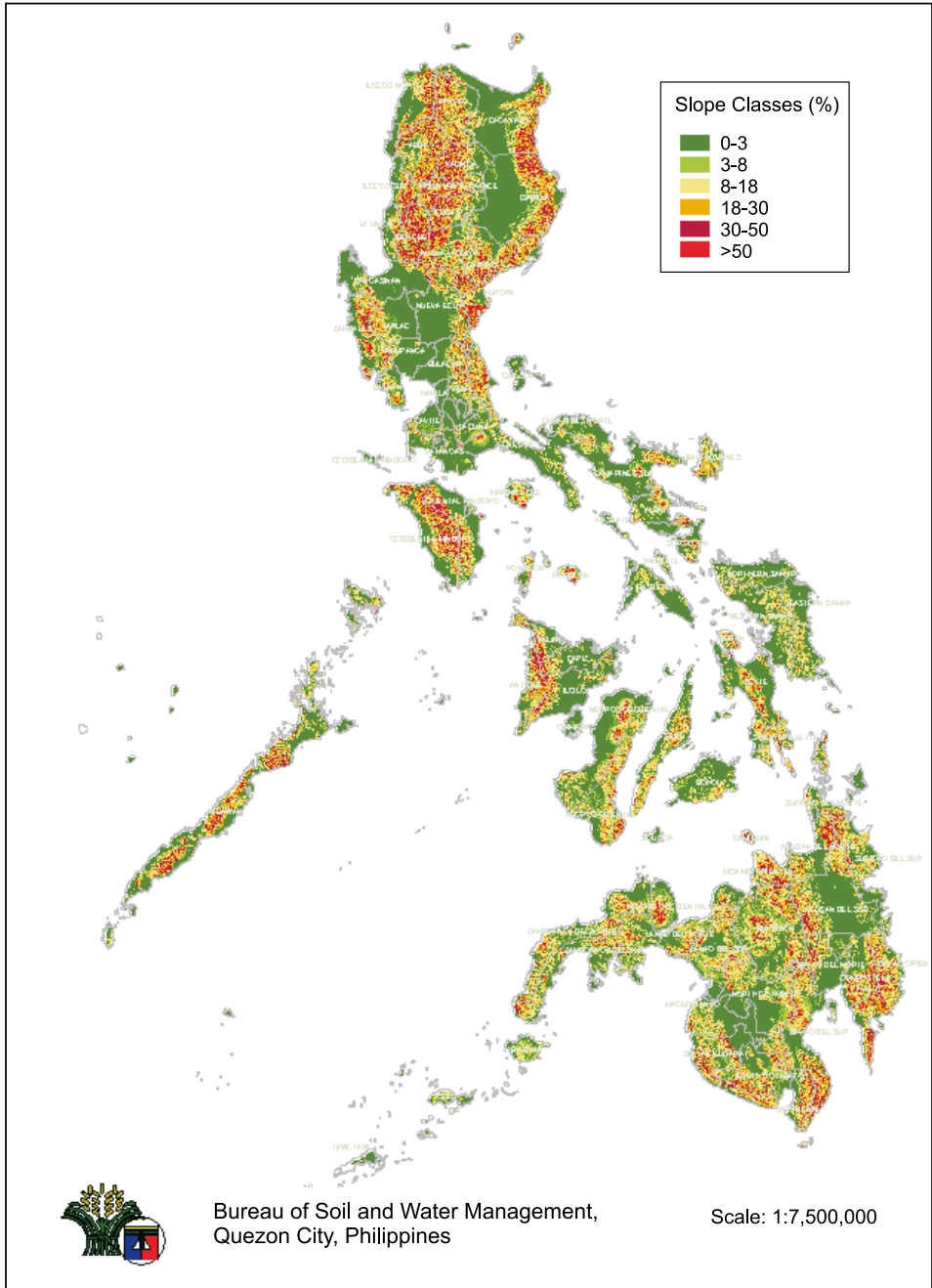


Figure 2. Slope map of the Philippines
Source: www.fao.org/AG/AGL/swlwpnr/reports/y_ta/z_ph/phmp231.htm

However, population growth and diminishing area available for cultivation have led to reduced fallow lengths, rendering *kaingin* less sustainable.

Migrants started to move into the area as early as the late 19th century⁶ (FDC 1985), but a massive influx began in the 1960s and peaked between 1980 and 1985, when a net migration rate of 14.5 percent was recorded (Cruz *et al.* 1992). Most migrants were driven into the uplands by landlessness and a dearth of employment opportunities (Porter and Ganapin 1988, Cruz *et al.* 1992). Limited knowledge of the upland ecosystem and limited land for cultivation prevents them from practising appropriate farming techniques such as allowing for fallow periods (Tucker 1987 as cited in Porter and Ganapin 1988). Recent forest rehabilitation initiatives have involved the participation of both indigenous and migrant populations using incentives such as secure land tenure, employment, and other livelihood benefits.

2. Forest cover change and degraded forest lands

The Philippines has had an unrelenting onslaught on forest resources, leading to its current diminished and degraded state. When the Spanish colonisers entered the archipelago in 1521, about 27 million ha or 90 percent of the country was covered with lush tropical rainforest (Lasco *et al.* 2001). Kummer (1992) identifies population growth and the spread of commercial crops as the most likely causes of deforestation during the Spanish regime.

In 1900, about two years after the Americans substituted the Spanish, about 70 percent or 21 million ha was still forested (Garrity *et al.* 1993, Liu *et al.* 1993). The Americans introduced the first modern logging operations in 1904 when the Insular Lumber Company was granted a 20-year renewable concession to log approximately 300 km² of rich dipterocarp forest in Northern Negros in the Visayas (Roth 1983). Dipterocarp lumber (otherwise known as the “Philippine mahogany”) was introduced to the world market. By 1940, 163 sawmill and logging companies were operating nationwide with a total investment cost of P30,116,550⁷ (de la Cruz 1941). About 40 percent of the investment was owned by Americans, 33 percent by Filipinos, and the remaining shared among the Chinese, British and Japanese. American colonial records in 1920 state that 19 million ha or 64 percent of the country was covered with forest (Bautista 1990). Between 1934 and 1941, however, forest cover declined to around 17 million ha or 57 percent of the land area (Table 1).

⁶ For instance, historical records indicate that early settlers started to occupy the Mt. Makiling Forest Reserve area in 1898 to 1899 (Cruz *et al.* 1991).

⁷ Conversion rate roughly 50 Philippine Pesos for one US Dollar.

Table 1. Change in forest land area by forest type (million ha), 1934-2003

Forest Type	1934a	1934b	1941	1969a	1969b	1976	1980	1988	2003
Old-growth dipterocarp	10.7	11.1		4.4	5.3	3.67	2.99	0.99	
Closed forest									2.56
Open forest									4.03
Commercial forest			13.52						
Non-commercial forest			3.72						
Residual dipterocarp, Second growth	n.a.	2.5		3.4	3.3	n.a.	n.a.	3.41	
Broad-leaved forest	2.5								
Pine (<i>Pinus</i>)	0.5	0.5		0.3	0.2	n.a.	n.a.	0.24	
Seasonal molave (<i>Vitex parviflora</i>)	0.4								
Seasonal without molave	0.4								
Mangrove	n.a.	0.3		0.2	0.3	n.a.	n.a.	0.14	0.25
Forest plantation									0.33
Bamboo	0.03								
Mossy, unproductive	0.7	2.6		1.7	1.8	n.a.	n.a.	1.14	
Sub marginal								0.54	
Mid-mountain	1.9								
Total forest area	17.18	17.0	17.24	10.0	10.9	8.1	7.4	6.46	7.17
% of country area	57.3	56.7	58.22	33.3	36.3	27.0	24.7	21.5	23.9

Sources:

- Except for 1941, figures for 1934 to 1988 are as compiled by Bautista (1990) as follows:
 - 1934a: Ganapin (1987). Based on official data of former Director of Forestry Arthur Fisher
 - 1934b: Revilla (1988). Based on forest map
 - 1969a: Bonita and Revilla (1977). Based on large-scale photographs
 - 1969b: Extrapolated from the data in DENR, Philippine Forestry Statistics
 - 1976: Forest Management Bureau
 - 1980: Forest Management Bureau
 - 1988: Philippine-German Forest Resources Inventory Project, Natural Forest Resources of the Philippines
- 1941 figures are from the de la Cruz article (1941) in The Philippine Journal of Forestry
- 2003 figures generated by the National Mapping and Resource Information Authority and the Forest Management Bureau, based on land satellite ETM images from 2002 and 2003 (FMB 2004)

Forest cover continued to decline after World War II (Table 1), although estimates of the deforestation rate vary. A national inventory conducted in 1982-88 by the RP-German Forest Resources Inventory Project of the DENR Forest Management Bureau (FMB) estimated forest cover at 6.46 million ha or 21.5 percent of the total land area in 1988 (Bautista 1990).

The 1990 Master Plan for Forestry Development estimated previous forest loss based on available information (DENR 1990). Between 1934 and 1990, the country lost 10.9 million ha of forest cover, equalling an average annual loss of 194,000 ha (Table 2). Of this area, 10.37 million ha, or 95 percent, was converted

to other uses while 0.52 million ha was damaged by logging. From 1934 onwards, the loss rate increased dramatically until it peaked at 300,000 ha per year in the decade 1965-75. The rate then gradually declined to 100,000 ha per year from 1985-90.

Table 2. Forest cover loss (in 1000 ha) from 1934-1990

Description	1934-1945	1945-1955	1955-1965	1965-1975	1975-1985	1985-1990	Total 1934-90	Average annual loss
Starting cover	17,000	15,700	13,900	11,600	8600	6600		
Less losses due to:								
• conversion	1260	1740	2200	2835	1880	460	10,375*	185
• Logging damage	40	60	100	165	120	40	525**	9
Total losses	1300	1800	2300	3000	2000	500	10,900	194
Final cover	15,700	13,900	11,600	8600	6600	6100		

Reference: Based on secondary data interpretation by the 1990 Master Plan for Forestry Development.

* Total forest cover loss

** Damage out of 5.3 million ha logged

The main causes of deforestation and land degradation after World War II include intensive logging (both legal and illegal) and agricultural expansion (partly linked to upland migration). Commercial logging tended to begin the process by opening up the forests and providing access roads for agricultural expansion. The underlying causes can be traced to structural forces such as (a) the elite’s control of wealth in the lowlands and uplands, and large-scale exploitation of forest resources for private gain, and (b) inequitable access to land and assets for the majority, high population growth, and lack of urban job creation leading to poverty, migration and dependence on forests and uplands (Porter and Ganapin 1988, Kummer 1992, Cruz *et al.* 1986).

In 2003, the National Mapping and Resource Information Authority (NAMRIA) and the FMB generated a set of land/forest cover statistics using LANDSAT ETM images from 2002 and 2003 (FMB 2004). The analysis used harmonised land/forest cover terms and definitions in accordance with international standards (FMB 2004). Results show that the total forest cover in 2003 was about 7.2 million ha or 24 percent of the country’s land area. The new figure is 11 percent higher than the 1988 forest cover of 6.5 million ha. Out of the 7.2 million ha, 6.5 million ha were found within forest land while the remaining 0.65 million ha were within alienable and disposable lands. Open forests constitute four million ha, closed forests 2.5 million ha, plantations 330,000 ha and mangroves 250,000 ha respectively. Much of the remaining forest is in the MIMAROPA, the Cagayan valley, the Cordillera Administrative, the Central Luzon and Eastern Visayas regions, in that order.

DENR attributes the increase in forest cover to the slowdown in commercial logging due to a logging moratorium in several provinces, a shift in logging from old-growth to residual forests in the early 1990s, log and lumber export bans, and accelerated public and private reforestation efforts (Defensor 2004). Also, many timber licence agreements (TLAs) expired and non-performers were cancelled in the early 1990s. The implementation of Industrial and Socialized Industrial Forest Management Agreements (IFMA and SIFMA) were expanded, covering most areas where TLAs had expired. In 1995, Community-Based Forest Management (CBFM) was adopted as the national strategy for managing the country's forest lands. These policy shifts and initiatives are also believed to have contributed to increasing the country's forest cover (Mayumi Quintos-Natividad, personal observation).

Others argue that natural old-growth and secondary forests continue to decline because of logging and expanding frontier agriculture (David Kummer, personal communication; Guiang 2001), and the forest cover increase is primarily due to regrowth vegetation and plantations established through reforestation projects and spontaneous tree growing by farmers and others. Agroforestry and fruit trees may also be included in the estimates.



Imperata grass-covered uplands. (Photo by John Turnbull)

If 6.5 million ha or 41 percent of the officially designated forest land is under some sort of tree-based vegetation at present, this leaves 9.3 million ha of forest land without forest cover. Many of these areas devoid of forest cover will need to undergo rehabilitation for ecological and socioeconomic purposes such as soil and water protection, biodiversity conservation and livelihood development. According to Esteban (2003), the FMB believes that 12 million ha should be ideally under forest cover, leaving a potential rehabilitation target of 5.5 million ha.

3. Evolution of national rehabilitation initiatives

For the purpose of this analysis, the history of national rehabilitation initiatives is divided into three periods: the colonial period (1910-1945); post-war, government-initiated projects (1946-mid 1970s); and, multi-sectoral efforts (mid 1970s-present). Annex 1 summarises the key characteristics of rehabilitation in these three periods.

3.1 Rehabilitation during the colonial period (1910-1945)

The first recorded rehabilitation initiative dates back to 1910 when the country's first Forestry School (now the College of Forestry and Natural Resources) was established in Los Baños, Laguna, Luzon. By 1916, students and the academe had experimented with about 600 species in the School nursery and plantation as part of silvicultural classes. The same year saw the Government's initial attempt to extensively plant barren lands, with the Philippine Legislature appropriating P10,000 under Act 2649 to reforest an aggregate 4095 ha in the Talisay-Minglanilla Friar Lands Estate in Cebu province. According to Orden (1960), the project started by evicting people considered as "squatters" and hostile to the project and planting 73 percent of the area. Lack of funds, however, halted the work for some time, resulting in local people returning to the area to make clearings and plant ipil-ipil (*Leucaena leucocephala*) and other fast-growing tree species.

In 1919, the Magsaysay Reforestation Project was established in Arayat, Ilocos, and Zambales, all on Luzon. This was followed by the establishment of a Cinchona plantation in Bukidnon (Mindanao) in 1927 and three other reforestation projects until 1931. From 1910 until 1936, meagre government funds limited rehabilitation efforts generally to experimental planting, small plantations, and studies on suitable species and seed treatment to hasten germination. More extensive reforestation took place from 1937 to 1941 when the Government appropriated funds for larger-scale activities. A special office was established under the Director of Forestry to inspect new projects. The Makiling Reforestation Project was established at this time.



Makiling Forest Reserve in 2004. (Photo by Takeshi Toma)

At the outbreak of World War II, 35 projects were in operation covering 535,000 ha. The projects were mostly located on Luzon, involving 11 sites in Northern Luzon, 14 in Central Luzon, and one in Southern Luzon. Six sites were located in Visayas and three in Mindanao. Sizes varied from 378 ha in Iloilo in the Visayas to 2696 ha in Mountain Province in Northern Luzon. Of the targeted 535,000 ha, 26,660 ha were fully planted. In addition, nurseries covering 24 ha with an annual capacity of 17 million seedlings were established in the reforestation sites.

From 1910 to 1941, a total of about P3.57 million (Annex 1) was spent on reforestation including nursery and plantation establishment and maintenance. This amounted to around P134/ha. The Government was the main actor and the main objectives were research, greening barren lands and providing environmental services to the public. The projects were to be long-term reforestation sites managed by the Bureau of Forestry. Government appropriations were the primary funding source. Communities were not involved and in one case they were actually evicted. During the Japanese occupation, a large portion of the established plantations was destroyed. Only 15 percent or 4000 ha of the original plantations survived the war.

3.2 Post-war, government-initiated rehabilitation (1946-mid 1970s)

From 1946 to June 1948, very limited funds were made available for reforestation. As a result, only 29 of the 35 projects operating before the war were reopened. Work was mostly confined to rehabilitating nurseries, recovering looted equipment and tools, reconstructing infrastructure, building fire lines, and cleaning plantations (Orden 1960). Reforestation activities started in earnest again in July 1948 when Republic Act 115 made available a new and permanent funding source to revive reforestation initiatives halted during World War II. To support reforestation projects, the Act levied charges for each cubic metre of timber removed for commercial purposes from any public forest. By 1960, the Government had planted 55,381 ha and spent P20,267,375 since 1916. This translated to a cost of P581/ha from 1947-60.

In 1960, the Reforestation Administration was created under Republic Act 2706. From 1960 to 1972, reforestation projects increased from 57 to 91 (presumably including those established during the pre-war period), with a cumulative total of 182,000 ha planted (Esteban 2003). Of these projects, 46 were in Luzon, 31 in Visayas and 14 in Mindanao. In 1972, the Reforestation Administration was integrated with the Bureau of Forestry, Parks and Wildlife Office, and Southern Cebu Reforestation Project under Presidential Decree (P.D.) 1. In the same year, Letter of Instruction No. 3 integrated reforestation activities into the mandate of the then Bureau of Forest Development. From 1973-74, DENR planted a further 10,781 ha.

In summary, until 1974, the Government rehabilitated a modest area (161,714 ha) at little cost and using casual labourers. They established plantations of mainly indigenous species. The main objectives were to regreen barren lands, offset deforestation, and compensate for the timber industry's declining supply of raw materials from natural forests. Very minimal information exists on survival of these plantations and other outcomes. Hyman 1983 (as cited by Magno 1994) stated that the projects performed poorly due to inadequate funding, technical inefficiencies and corruption.

Forest occupants were generally evicted as they were considered to be the main culprits responsible for destruction and a hindrance to rehabilitation. With a few exceptions such as the Paper Industries Corporation of the Philippines (PICOP) which planted trees on its own and in partnership with farmers, the Government failed to engage the timber companies in reforestation activities on the vast forest lands allocated to them for logging. Private sector engagement was minimal because there were limited efforts compelling them to rehabilitate, and natural forest timber was still plentiful and available at little cost. The rehabilitation efforts thus failed to

address the underlying causes of degradation: a) logging excesses, and b) livelihood needs and inequitable access to resources of growing upland populations.

3.3 Multi-sectoral rehabilitation efforts (mid 1970s-present)

To stem the high forest depletion rate and enhance forest rehabilitation, the Government sought new approaches involving the private sector and civil society. P.D. 705, issued in 1975, required nationwide reforestation activities with private sector participation. P.D. 705 defined the forest lands to be reforested as those with barren, grass or shrub cover; denuded areas within forest concessions, reserves and reservations, critical watersheds, national parks and other protected areas; areas covered by pasture leases needing immediate reforestation; and miscellaneous areas such as riverbanks and road right-of-ways. From 1976, the holders of TLAs were given the responsibility to reforest inadequately-stocked forest lands within their concessions. In the same year, the Program for Forest Ecosystem Management was launched, calling for a holistic approach to forest management involving all sectors of society. The following year, P.D. 1153 was issued requiring all able-bodied citizens, 10 years and older, to plant 12 seedlings annually for five consecutive years.

In 1979, Letter of Instruction No. 818 was enacted, compelling all timber licence, lease and permit holders to reforest one hectare of denuded or brush land for every hectare logged. Two years later, Executive order (E.O.) 725 was issued further encouraging industrial tree plantations (ITPs), tree farms (TFs) and agroforestry farms (AFFs) on denuded forest lands through long-term leases. P.D. 705 had stipulated this earlier and P.D. 1559 amended it in 1978. Incentives included low fees and taxes, credit facilities, free technical assistance, and unrestricted exports of plantation products.

By the end of the 1970s, the private sector, government agencies other than the Bureau of Forestry, local government units and citizens were involved in forest rehabilitation efforts as a result of government proclamations issued since 1975. Of the 64,541 ha planted in 1981, 33,834 ha or 52.42 percent was planted by groups besides the forestry department (Figure 3).

The government initiated numerous people-oriented forestry programs in the early 1980s, such as the Integrated Social Forestry Program in 1982 and the Community Forestry Program in 1987. Many of the projects were funded by foreign donors such as the Ford Foundation, World Bank, United States Agency for International Development (USAID) and the German Technical Cooperation (GTZ), and executed by or in collaboration with the DENR. They tended to be small-scale agroforestry and social forestry projects targeted at meeting the livelihood needs of farmers and communities and addressing environmental degradation in the uplands. About the

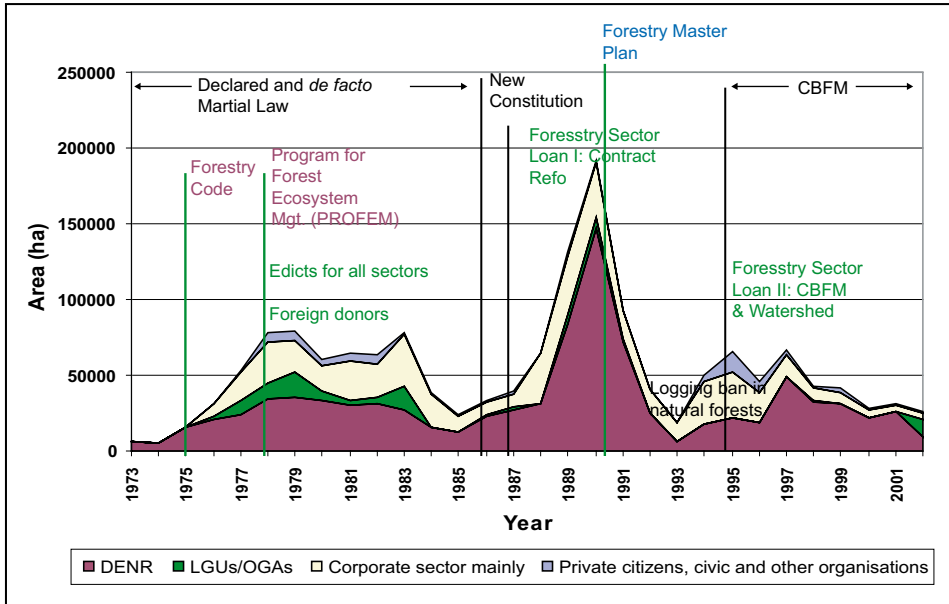


Figure 3. Plantings by all sectors by year, 1973–2002. Adapted from Acosta (2003)

same time, NGOs began pioneering work in forest regeneration and agriculture with upland farming communities. The three main efforts were a mission in southern Mindanao adopting “Sloping Land Agricultural Technology (SALT)”, the work of World Neighbours in hilly farming communities, and a mission by Pastor Delbert Rice with the indigenous people in Sta Fe Nueva Viscaya (Ed Queblatin, personal communication). Beginning in the 1980s, the need to address upland poverty and promote livelihood opportunities began to drive rehabilitation efforts, in addition to the traditional objectives of greening barren lands and producing timber.

After the 1986 “People’s Power” Revolution, the country regained its credibility with international funding institutions, enabling it to access huge financial assistance to support forest rehabilitation initiatives (Korten 1994). The major initiatives included the Forestry Sector Projects (FSP) I and II established in 1987 and 1995 respectively under the so-called National Forestation Program (NFP). The NFP aimed to rehabilitate 1.4 million ha nationwide from 1987 to 2000, or an average of 100,000 ha per year (Magno 1994). The long-term target was to reforest 6.5 million ha of denuded lands, including 1.4 million ha of critical watersheds needing immediate rehabilitation (Umali 1989).

FSP I replaced the traditional government-implemented reforestation with “contract reforestation” involving families, local communities, NGOs, LGUs, and the private sector. Under the *contract reforestation* scheme, contractors were paid a fee for reforesting and maintaining a particular area for three years with an

expected survival rate of ≥ 80 percent and an average height of 0.8 m. After the contract period, the area was to be turned over to the DENR.

FSP II was implemented through Community-Based Forest Management (CBFM). Organised communities were contracted to reforest and they were given tenure over the areas they developed. E.O. 263 in 1995 adopted CBFM as the national strategy for sustainable forest management and social justice. This was in response to the government-corporate partnership's inability to arrest forest degradation and address upland poverty and inequitable access to forest resources (Pulhin 2003). The CBFM program unified all the Government's people-oriented programs and projects, including those implemented in the early 1980s. It entrusted local communities with responsibility for forest rehabilitation, protection and conservation, with the promise of equitable access to forest benefits. Some of the earlier *contract reforestation* areas were also placed under PO management through Forest Land Management Agreements that entitled them to maintain and protect the area and share future benefits with the Government at harvesting time. In the long run, many of these areas also became CBFM Agreement sites.

FSP I was funded by a US\$120 million Asian Development Bank (ADB) loan with US\$120 million counterpart funding from the Overseas Economic Cooperation Fund (OECF) of Japan and US\$43 million from the Philippines Government (GOP) (Tolentino 1992 as cited by Magno 1994). FSP II was funded by a US\$39.7 million ADB loan, US\$55 million Japanese Bank for International Cooperation (JBIC) loan and US\$44.57 million GOP counterpart funding. Estimated costs of P20,410.06 for establishing, protecting and maintaining a one-ha plantation over three years were revised to P43,146 per ha under the Loan II component funded by JBIC. The most recent data from the FMB indicates that from 1987 to 2001, a total of P4927 million (US\$98.54 million)⁸ was spent under the comprehensive site development component⁹ of the FSP with 299,000.63 ha planted. This equals an average reforestation cost of P16,423.77 (US\$382.47) per hectare over the 14-year duration of the program (NFDO Briefing Kit 2003). The area planted, 299,000 ha, was much smaller than the 1.4 million ha targeted.

⁸ This excludes the cost of community organising which is a separate contract under CBFM normally granted to NGOs or assisting professionals to provide technical and social preparation to POs before a comprehensive site development contract is awarded.

⁹ Sites under FSP had "comprehensive site development plans", which included timber and fruit tree plantations; agroforestry; other plantations such as rattan, rubber and bamboo; assisted natural regeneration; timber stand improvement and enrichment planting.

Other foreign-assisted projects directed at benefiting farmers and local communities continued through the 1990s to present. These included the Cordillera Highland Agricultural Resources Management Project Reforestation Component (ADB and the International Fund for Agricultural Development (IFAD)); Southern Mindanao Integrated Coastal Zone Management Project (JBIC and Philippines Government); Philippine-German Community Forestry Project - Quirino (GTZ/ German Development Bank (KfW)); Developing Tropical Forest Resources through Community-Based Forest Management (International Tropical Timber Organisation (ITTO)); and, the Low-Income Upland Communities Project (ADB). The DENR administered many of these projects.

The private sector reforested large areas in three periods since 1975: from 1977-84, 1988-90 and 1994-96 (Figure 3). Generally more than 20,000 ha were planted annually during these periods. The series of government proclamations impelled TLAs to reforest from 1977-84 and the logging ban in natural forests motivated TLAs to reforest from 1994-96. Most planting since 1975 was done by TLAs; and ITPs, TFs and AFFs contributed very little. Two new private sector tenurial/management agreements, IFMA and SIFMA¹⁰, were instituted in the 1990s to revitalise the industrial forest plantation program and generate income for smallholders in the uplands. However, private sector efforts have been declining over the last years because TLAs have expired or been cancelled, incentives have been inadequate and policies have been highly unstable. Only 8568 ha were planted under IFMA and SIFMA and 3963 ha in TLAs from 2000-02 (DENR data). The constraints pointed out by the private sector (Acosta 2002, Gayo 2000) include:

- a) Tenure duration is too short to make long-term investments.
- b) Obtaining credit is difficult.
- c) Development and transport costs are too high to be financially viable.
- d) Frequently changing policies affect plans and operations, particularly regarding timber harvesting rights.
- e) Marketing support is low.

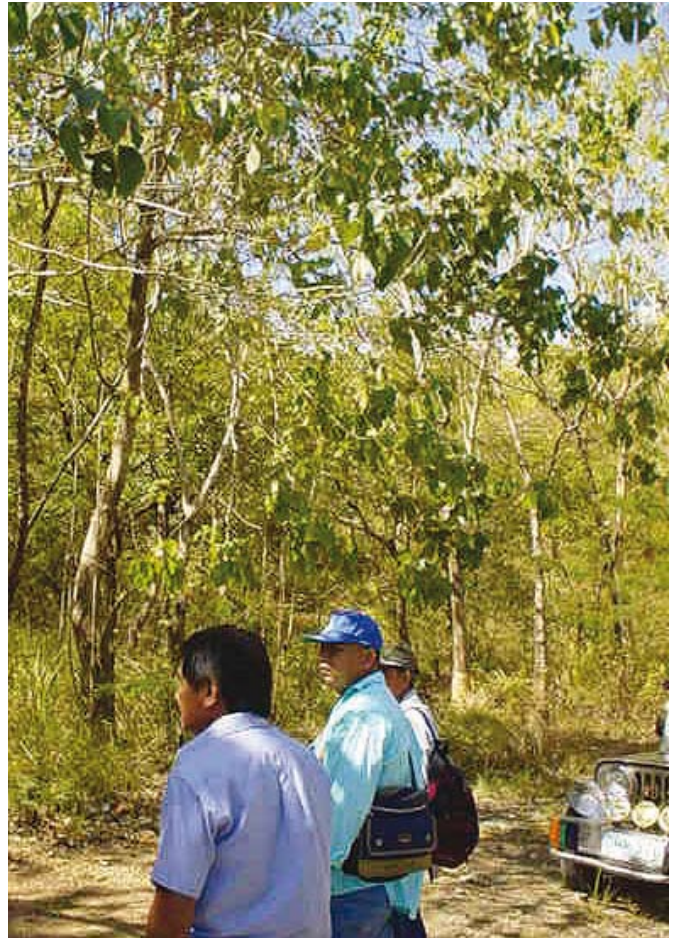
There have been some new LGU initiatives in recent years (Figure 3). The 1991 Local Government Code empowered LGUs to enforce forestry laws and engage in reforestation projects in partnership with the DENR and communities. Some LGUs in Luzon and Mindanao passed provincial/municipal resolutions appropriating funds to finance CBFM and reforestation projects in their localities. Some successful initiatives include those established by the provincial governments

¹⁰ IFMA and SIFMA grant the private sector the right to develop, manage, and benefit from plantations (and natural forest areas in IFMA II) over a lease period. SIFMA is for smaller areas while IFMA is larger in scale.

of Nueva Vizcaya in Northern Luzon and Bukidnon in Mindanao, and by the municipality of Pilar, Bohol in the Visayas.

In summary, from the late 1970s to 2000, substantial money was invested in forest rehabilitation through both large and small projects, and many different actors were involved. Budgeted costs easily totalled US\$570 million or more, with most funding (about 93%) coming from public investment including foreign loans (Annex 1). Foreign grants and private investment make up the remainder. DENR records show a total of 5503 registered CBFM communities or POs from 1975 to the present and around 2200 registered private initiatives (TLAs, TFs, ITPs, IFMAs, and SIFMAs). There were also an undetermined number of DENR regular and special projects, and an undetermined number of projects by LGUs and other government agencies (OGAs) such as the National Irrigation Administration, National Power Corporation, Philippine National Oil Company, Water Districts and Academe. Many were integrated projects, in which rehabilitation was just one component.

They established plantations of mainly (80%) exotic species such as mahogany (*Swietenia macrophylla*), *Acacia mangium*, *A. auriculiformis*, *Eucalyptus* and *Gmelina arborea*. Agroforestry was also important, while assisted natural regeneration and enrichment planting played a smaller role. The main objectives were to regreen barren lands, produce timber, enhance watershed services and address upland poverty. The total area reported as planted from 1975-2002 was 1,597,472 ha, with the bulk (920,962 ha) planted by the DENR; 100,485 ha by LGUs and OGAs; 410,112 ha by timber licence holders; 93,520 ha by other private enterprises and leaseholders; and 72,393



Reforestation with *Gmelina arborea* in the Pantabangan watershed. (Photo by Rodel D. Lasco)

ha by private citizens and civic organisations. FSP I and II contributed to around one-third of the DENR reforestation in this period.

Available limited information on survival of these plantations and other outcomes is summarised in Section 5.1. FSP I performed poorly on many fronts, having failed to address an underlying cause of degradation: livelihood needs and inequitable access to resources of upland populations. FSP II appears to have had more mixed results, and little is known about other government and non-governmental initiatives. Rehabilitation efforts have been declining in the last decade with no new major external funding and inadequate incentives for the private sector.

4. Major driving forces for rehabilitation and shifts in approaches

Scientific, environmental, political, institutional and socioeconomic factors drove rehabilitation of degraded forest lands in the Philippines and the types of approaches used.

4.1 Scientific enquiry

The earliest recorded rehabilitation initiative in 1910 was driven by scientific curiosity. Practical methods for planting trees on *Imperata* grassland areas were tested and suitable species were identified. By 1914, approximately 120 species had been tried in the Forestry School's nursery and plantation, increasing to 600 species by 1916. The trials identified a number of species suitable for reforestation in the area. These included molave, narra (*Pterocarpus indicus*), supa (*Sindora supa*), para rubber (*Hevea brasiliensis*), taluto (*Pterocymbium tinctorum*), kalantas (*Toona calantas*), malaruhit (*Cleistocalyx operculatus*), teak (*Tectona grandis*), mahogany, ipil (*Intsia bijuga*), lumbang (*Aleurites moluccana*), banaba (*Lagerstroemia speciosa*), agoho (*Casuarina equisetifolia*), bitaog (*Calophyllum inophyllum*), baguilumbang (*Reutealis trisperma*), akle (*Albizia acle*), tindalo (*Afzelia rhomboidea*), ipil-ipil and kakawate (*Gliricidia sepium*) (Orden 1960).

4.2 Promotion of environmental stability

The promotion of environmental stability also drove early reforestation efforts. Most projects prior to the 1960s were located in established forest reserves, national parks; the watersheds of Agno, Pampanga and Cagayan in Luzon, and other places where problems of flooding, erosion, and soil and water conservation required attention (Orden 1960).

Environmental considerations continued to be a major driver of rehabilitation in the succeeding decades. P.D. 705 as amended by P.D. 1559, identified “denuded or inadequately timbered areas proclaimed by the President as forest reserves and reservations” as target reforestation areas for environmental objectives. These areas included critical watersheds, national parks, game refuges, bird sanctuaries, national shrines and national historic sites. Similarly, one long-term aim of the NFP launched in 1986 was the “restoration and maintenance of a stable, functional and wholesome environment” (Umali 1989).

This objective was reinforced when massive floods occurred, such as in 1991 when the city of Ormoc, Leyte in the Visayas was inundated, claiming 4000 lives and leaving 2000 people missing (Vitug 1993). A similar incident occurred in December 2004 in Quezon and Aurora provinces in Luzon where hundreds of people died and thousands were rendered homeless when heavy rains triggered landslides and flash floods. Though refuted by many scientists, environmentalists and the government widely attributed the floods to forest destruction through logging (media reports for the period). These events spurred the DENR to issue logging suspensions and incorporate rehabilitation into its 2005-2010 Plan of Action for the forestry sector.

4.3 Political factors and funding availability

The Philippines’ political milestones and accompanying changes in forestry policies and programs were major driving forces behind rehabilitation post 1970s. Major changes in political leadership affected both public and private efforts. Plantings usually peaked when new government administrations were implementing major forestry programs. For instance, the declaration of Martial Law in 1972 was followed by the issuance of the Revised Forestry Code of the Philippines (PD 705) in 1975. With a fresh policy direction and additional funds allocated to the forestry sector, reforestation activities increased dramatically (Figure 3). The Program for Forest Ecosystem Management was conceived in the late 1970s and implemented in the 1980s. A series of edicts compelled TLA holders, LGUs, OGAs and private citizens to plant trees. Rehabilitation efforts in all sectors peaked during this period. Total reforestation efforts per year were close to 80,000 ha in 1978, 1979 and 1983. Eventually, efforts and enthusiasm waned due to declining financial support from the Government and lack of appropriate incentives to the private sector.

The fall of the Marcos Government in 1986 was followed by the promulgation of the New Philippine Constitution in 1987 and the Forestry Master Plan in 1990. Environmental programs, particularly reforestation, were supported during this period, with FSP I providing fresh funds. Due to failures of past efforts, the regular government reforestation projects were stopped and the *contract reforestation* scheme attempted. The area recorded as planted exceeded the 100,000 ha per year mark and also exceeded the annual deforestation rate for the first time.

The *contract reforestation* scheme showed that contracts with families and communities were more successful. Hence FSP II provided funding to support the CBFM program, which was then strengthened through E.O. 263 adopting it as the national forest development and management strategy. From 1996 to 2003, most government funds for reforestation were channelled to organised communities or POs through comprehensive site development contracts. The last contract payments were made in late 2003 as the sectoral loan finally ended and closed all transactions with the POs.

JBIC has in its pipeline another forestry sector loan for P6.027 billion to rehabilitate some 86,000 ha of denuded forest land in the Philippines. This funding, if it materialises, could again boost reforestation efforts. However, there may be a major shift in approaches since the DENR is contemplating reducing the population in the uplands as part of sustaining the rehabilitation effort (www.denr.gov.ph/article/view/3477). Shifts in the political climate or conflicts could further define or alter the approaches used.

4.4 Imminent timber shortage

The 1950s to early 1970s were characterised by a logging boom in the Philippines. The area under TLAs more than doubled between 1958 and 1970, from 4.6 to 9.4 million ha. Consequently, the annual allowable cut also more than doubled from 7.2 to 15.5 million cubic metres. However, timber started to run out in the 1970s, especially in some parts of Luzon. By the mid-1970s, logging areas in central and western Luzon were either abandoned or covered by logging bans (Boado 1988). The imminent timber shortage contributed to reforestation efforts intensifying in the early 1970s. As already mentioned, the Government initiated some policies and programs to encourage and support timber production:

- a) P.D.1153, otherwise known as the “Tree Planting Decree”.
- b) The Program for Forest Ecosystem Management that established one municipal nursery for each of the 1000 municipalities and increased the role of the Bureau of Forest Development in reforestation.
- c) The Energy Farm Program, which required each *barangay* to plant at least two hectares as a community fuel reserve.
- d) P.D. 705 and 1559 and E.O. 725 encouraged the establishment of ITPs, TFs and AFFs, and the reforestation of inadequately-stocked forest lands within forest concessions to help supply the raw material needs of forest-based industries.
- e) The NFP was to provide adequate industrial timber and fuelwood supply in addition to its environmental and socioeconomic objectives (Umali 1989). The NFP thus targeted reforesting 1.4 million ha from 1987 to 2000.

Areas rehabilitated through the NFP and other government and private sector initiatives contribute little to the country’s timber supply at present. Yet, the threat

of a timber famine continues to drive reforestation efforts. The 2003 Revised Philippine Master Plan for Forestry Development has targeted the establishment of 40,000 ha of commercial plantations per year or a total of one million ha over the next 25 years to meet the nation's timber requirements.

4.5 Socio-economic considerations

Socioeconomic considerations are another major rehabilitation driver. Prior to 1982, upland occupants either served as merely labourers or were ejected to make way for government reforestation projects. This caused great animosity between the Government and the upland communities and contributed substantially to the failure of past rehabilitation initiatives.

The emergence of people-oriented forestry programs in the 1980s and the 1990s shifted the emphasis from the traditional approach of “getting the trees on the ground” to “getting the livelihoods of the people off the ground” (Peluso 1992), through their involvement in reforestation and other forestry projects. The major programs believed to have boosted the country's reforestation efforts include the Integrated Social Forestry Program established in 1982, the Community Forestry Program in 1987, and the 1995 CBFM program. Other than providing additional sources of income through participation in the different reforestation activities, these programs also provided incentives and support to upland communities by providing tenure rights over reforested areas and livelihood support. Also for the first time, projects followed a deliberate and participatory planning process in which the communities were involved starting from area identification to development planning, project implementation, monitoring and evaluation. The exact contribution of these programs to the overall rehabilitation effort is yet to be ascertained. However, with CBFM adopted as the national strategy for sustainably developing the country's forest lands, it would be safe to assume that most plantations established by the DENR from 1996 to 2002 — 185,407 ha, according to FMB records — were accomplished through CBFM.

4.6 Institutional dimensions

At least eight major groups of actors drive the processes and outcomes of forest rehabilitation in the Philippines: the Congress, the Presidents, the DENR, LGUs, OGAs, upland farmers/local communities and POs that represent them, NGOs and the rest of the civil society, the private sector, academic and other research institutions, and the donor community. Their roles are presented in Table 3. Since forest rehabilitation initiatives are mostly implemented in classified forest lands, the DENR is the dominant actor in all rehabilitation efforts. However, rehabilitation is a complicated process given the presence of other stakeholders from various sectors and levels of the society and the diversity of their personal and institutional interests and priorities. The dynamic interaction among them influences not only the form but also the substance of forest rehabilitation.

Table 3. Key players and their roles

Key Players	Major Role in Reforestation
The Philippine Congress (Senate and House of Representatives)	The Congress has the mandate to provide the legal framework for forest development and management including reforestation. The last legal framework P.D. 705 (as amended by P.D. 1559), issued 29 years ago, is outdated and does not address the present needs and challenges.
The President	Of the country's five presidents since 1965, President Ferdinand Marcos' Administration issued the most policies relevant to rehabilitation. However, the Forestry Sector Projects were initiated during the administrations of Presidents Corazon Aquino and Fidel Ramos. The administrations of Presidents Joseph Estrada and Gloria Macapagal-Arroyo merely sustained their predecessors' initiatives, particularly FSP.
Department of Environment and Natural Resources (DENR)	The DENR is the main government agency concerned with implementing forest rehabilitation initiatives. It promulgates rules and regulations that translate the generalities of law into concrete terms. The DENR Secretary is responsible for issuing Administrative Orders and Memorandum Circulars that guide the implementation of forest laws or decrees issued by the President. On the ground, outcomes are largely influenced by the dedication and competence of the DENR field offices and staff at the regional, provincial and municipal levels, and their ability to mobilise local support and resources.
Private sector	The private sector holds various leases of public forest lands such as the TLA, IFMA, Tree Farm Lease Agreement, Agroforestry Farm Lease Agreement, SIFMA, Private Forest Development Agreement and Forest Land Grazing Lease Agreement. Different policies mandated these private individuals, corporations or legal entities to be involved in rehabilitating certain areas covered by their leases. This sector's contribution depends on the policy, technical, marketing and related support and incentives available.
Local Government Units	The Local Government Code empowers LGUs to enforce forestry laws and implement reforestation and related forestry projects in partnership with the DENR and local communities. Some LGUs in Luzon and Mindanao have passed provincial/municipal resolutions appropriating funds to finance CBFM and reforestation projects. Successful LGU initiatives include those established by the provincial governments of Nueva Vizcaya in Northern Luzon and Bukidnon in Mindanao and by the municipality of Pilar, Bohol in the Visayas.
Other government and semi-government agencies	These include the National Irrigation Administration, National Power Corporation, and the Philippine National Oil Company, among others, which by virtue of legal arrangements with the Government are also tasked to engage in rehabilitation activities in watersheds under their jurisdiction. More recently, the Department of Finance has been involved in some initiatives in partnership with LGUs under its Community-Based Natural Resources Management Project supported by the World Bank.

Key Players	Major Role in Reforestation
Upland farmers/local communities and POs	This group is composed of both indigenous people and migrants on the ground doing the hard labour of forest rehabilitation. Until the early 1970s they were simply hired as labourers in reforestation projects and did not have tenure security over the land they occupied. More recently, the government encouraged upland farmers and communities to organise themselves into People's Organizations and play a larger role in rehabilitation projects. The government contracts the POs to implement planting, maintenance and protection activities; and may also provide them with tenure security over the land that they have reforested so that they can serve as long-term stewards of the forest resources.
NGOs and the rest of the civil society	NGOs and the rest of the civil society such as religious groups, media, and others, operate nationally and locally. Their influence ranges from providing technical and financial support to POs; policy advocacy; legal assistance especially to indigenous people; implementation, monitoring and evaluation of reforestation projects; and promoting community-level actions and demands. The Local Government Code allowed for civil society to be represented in the governmental and multi-sectoral policy-making bodies such as municipal, provincial and regional development councils as well as on the Protected Area Management Board. Civil Society's advocacy has been instrumental in E.O. 263 (CBFM) and the National Integrated Protected Area System Act of 1992 being passed, both of which include reforestation components.
Academic and other research institutions	Their main contribution lies in promoting science-based policies and programs; providing technical assistance and support; project monitoring and evaluation; critiquing government forestry policies, programs and projects; and producing a new breed of "people-oriented foresters" responsive to the needs of people-oriented reforestation initiatives.
Funding institutions	Multilateral and bilateral funding institutions act as global drivers of reforestation policies and programs in the Philippines. Their instrument of influence includes providing funds and budgetary and technical support. The chief among these are ADB, World Bank, JBIC, USAID, IFAD, ITTO, Ford Foundation, and the governments of New Zealand and Germany.

Source: Modified based on Pulhin (2003)

The degree of engagement of the various actors continues to evolve, shaping the process and outcome of forest rehabilitation along the way. For instance, DENR's inability to promote successful reforestation by itself had led to involvement of the private sector and the civil society in the different government-initiated reforestation programs starting in the late 1970s. Similarly, the availability of funding support from the different financial institutions in the late 1980s to 2000 boosted the country's reforestation efforts, although funding availability did not necessarily result in project objectives being achieved (Korten 1994). Private sector involvement has declined in recent years due to an unstable policy

environment and inadequate incentives. On the other hand, recent innovations among some LGUs could inspire others, like the efforts of Nueva Vizcaya provincial government (located in Region II in Luzon) in watershed management and reforestation. This can in turn influence future reforestation approaches and outcomes. However, most of the above actors are also likely to respond to major changes in the global and national political and environmental climate, which may promote or deter forest rehabilitation and cause shifts in the areas of focus and approaches used.

5. Reported achievements and impacts of rehabilitation

There are at least three major categories of achievements and impacts of rehabilitation in the Philippines: environmental, socio-economic and those relating to forest governance.

5.1 Environmental

The Forest Management Bureau's records indicate that about 1.7 million ha were planted over 42 years from 1960 to 2002 by different sectors. Of these, government sectors planted about two-thirds or 1.15 million ha, with non-government groups planting the rest. However, considerable planting on private land is not yet registered with the DENR. Different sectors have expressed major doubts as to how much of the recorded 1.7 million ha planted from 1960 to 2002 really exists. The information available at FMB is not supported by maps; hence most of the claimed planted areas cannot be easily located on the ground.

The reforestation rate lagged significantly behind the deforestation rate up to 1988. From 1969 to 1988, the nation's forest cover declined from 10.9 million ha to 6.46 million ha — a total reduction of 4.44 million ha over 19 years or an average annual loss of 233,684 ha. This means that the loss rate was more than five times the 41,855 ha, annual average area planted from 1969 to 1988.

However, reforestation projects and spontaneous tree growing by farmers and others have contributed to a forest cover increase of 0.7 million ha from 1988 to 2003. The relative contribution of project-based reforestation to increasing forest cover compared with spontaneous tree growing is undetermined.

FSP I sites had low survival rates three years after planting. Independent studies and field observations provide low estimates of 42 percent and below (UNAC 1992). DENR records show a range of 29-86 percent. FSP II sites may have had higher survival rates; a range of 59-93 percent was recorded by DENR. Recent

FMB records indicate an average survival rate of 71 percent for FSP I and II. Similarly, the 48 cases documented by the Upland NGO Assistance Committee recorded average 75 percent survival three years after plantations were established. While this appears to be relatively high, it does not meet the 80 percent survival rate required by the Government. Esteban (2003) suggests that past reforestation efforts had low short-term survival rates due to pests, fire, poor species selection, site matching, disregard for quality and end use, and poor silvicultural practices. However, survival statistics are not readily available for non-FSP initiatives.

Information is scant on long-term survival and growth beyond the initial establishment period. One threat to long-term survival is that much of the classified forest areas in the uplands are used for farming, and reforestation projects were commonly conducted without the farmers' participation or provision for alternative livelihoods. This was the case also with FSP I. Once projects were completed, local residents commonly cut down or burned the trees to farm or pasture the land again (Rambo and Hamilton 1990). In some cases the deliberate destruction of planted trees was also intended to prolong projects, which generated local jobs.

Pests and diseases pose another threat to long-term survival and vigorous tree growth. This threat is increased by the fact that 75 percent of the area under FSP I was planted with a single exotic species, namely, *Gmelina arborea* (Korten 1994). The species is known to be susceptible to a number of insects, parasites and fungal infections in the Philippines, especially if not mixed with other trees. While the DENR guidelines encouraged the use of multiple species, contractors were compelled to use *Gmelina arborea* and other fast-growing species because they were readily available. With the ambitious targets set by FSP I, contractors had no time to raise seedlings of other species.

Exotic species such as *Eucalyptus*, mahogany and *Gmelina arborea* have been commonly used in rehabilitation projects since the mid 1970s; this raises biodiversity and bio-invasion concerns. A recent study in the Mount Makiling Forest Reserve indicates that planted mahogany has bio-invasive characteristics that can prevent native dipterocarp seedlings surviving, and eventually reduce the area's biodiversity. More recently, however, native species are increasingly used in forest rehabilitation efforts, especially in protected areas.

In terms of environmental objectives, rehabilitation projects were meant to restore forest cover in degraded areas to promote soil and water conservation and moderate floods and droughts by absorbing much of the monsoon rains. However, the actual environmental effects have not been well evaluated. Some anecdotal evidence and field observations suggest that rehabilitating previously



Mahogany plantation. (Photo by Rose Jane J. Peras)

denuded areas has contributed to the restoration and environmental stability of selected sites. In Cebu, the Makiling Forest Reserve in Laguna, an LGU initiative in Nueva Vizcaya, and in some CBFM sites in Luzon, Visayas, and Mindanao, rehabilitation has resulted in some on-site and off-site environmental benefits such as soil and water conservation, improved micro-climate, increased soil fertility, biodiversity and aesthetic values (Pulhin 2005). Lasco and Pulhin (2006) summarize information from a few existing studies showing that tree hedgerow planting in cultivated hillsides has led to reduced soil erosion and surface runoff, and improved fertility in instances.

However, further empirical studies are required to assess the true impacts of rehabilitation projects and forest cover on soil and water conservation and flooding. Links between water and landscapes are complex. The kind of revegetation and management practices undertaken could have a beneficial or detrimental effect on a local scale, and their influence over a large basin is relatively small (FAO and CIFOR 2005).

5.2 Socio-economic

The socioeconomic impacts are both positive and negative. The different efforts have provided additional jobs for upland communities but this is mostly short-term. An assessment of selected reforestation contracts under FSP I conducted by the Upland NGO Assistance Committee revealed limited participation by

local people in decision-making (UNAC 1992). In most cases, contractors made no effort to develop a local people's organisation, and residents were involved only as hired labour. Participation has in some instances contributed to further marginalising the poor. Experiences in various areas showed that payment delays of up to three to six months resulted in the participating communities falling into debt, particularly those that were already economically disadvantaged (UNAC 1992). The relatively wealthier segment appears to have captured the economic benefits associated with reforestation projects (Pulhin 1996).

In some areas, earnings or funds saved from FSP I and II reforestation contracts and other CBFM rehabilitation efforts through cost-efficient operations have been the main source of the POs' capital accumulation, which they used to finance livelihood activities (Pulhin 1999). Generated income has likewise supported PO members to protect and maintain forests even after the end of their reforestation contracts (Tesoro 1999, Borlagdan *et al.* 2001). However, no overall statistics are available in this regard.

With forest communities being recognised as partners in forest development and management through the CBFM program, FSP II and other recent reforestation initiatives have provided tenurial security to the land the communities occupy. This is made possible through CBFM agreements that give POs the legal right



Local children on a reforestation site. (World Agroforestry Centre collection)

to develop and manage their lands and enjoy the benefits without fear of being evicted.

Frequent policy changes such as logging suspensions in response to major floods and other events have adversely affected CBFM participants, who rely on small-scale timber harvesting in the absence of alternative livelihood options. Communities who have been encouraged to take a stake in rehabilitating the country's degraded forest lands have no assured control over the resources they help develop. Also recent orders by DENR to cancel CBFM agreements in eight regions suggest that even the tenure over the land is not that secure after all (*www.denr.gov.ph/article*).

5.3 Forest governance

Recent initiatives have facilitated various sectors' active involvement in forest rehabilitation and management. This departs from the traditional approach of "reforestation by administration", which created a long history of animosity between the Government and local communities over the former ejecting the latter to establish reforestation projects. The government has initiated a better working relationship with other sectors. This could serve as a basis for future collaborative undertakings towards sustainable forest management. However, the non-government sector's involvement has been declining in recent years due to an unstable policy environment and inadequate incentives.

Experiences gained from different reforestation projects enhanced the institutional capacity of government and non-government sectors to implement rehabilitation initiatives. Both sectors have realised that technical and social preparation are important pre-requisites for successful rehabilitation.

On the downside, the opportunities provided by rehabilitation projects, particularly FSP I, have created room for graft and corruption. While not documented, it is common knowledge that some DENR personnel in the field were involved in anomalous transactions with reforestation contractors either in approving the contract, processing the documents to facilitate fund release, or in monitoring and evaluating the projects. The Government also finds it difficult to manage the payments of the massive loans taken for large-scale rehabilitation leading to high indebtedness (Korten 1994). The loans could not be paid back through direct returns from timber production due to lack of harvesting on most sites and poor long-term survival and maintenance of many FSP I plantations. Timber harvesting is constrained by marketing problems and unstable policies such as frequent suspensions of harvesting rights following environmental and political pressures.

6. Summary

From 1910 up to the mid 1970s, the government conducted some rehabilitation projects at little cost. From the 1970s, many different actors got involved and much money was invested by the government and foreign donors in small and large projects. Most early rehabilitation efforts up to the 1980s made little difference to forest cover and did not address the underlying forest degradation causes — logging excesses and livelihood needs of upland populations. FSP I from 1987 to the early 1990s performed poorly in all aspects. Efforts from the 1990s along with spontaneous tree growing activities increased forest cover significantly, though donor projects had a high and probably unsustainable economic cost. Effects on biodiversity and local communities were mixed with more recent efforts doing better. Positive impacts on soil and water conservation were reported in areas but empirical evidence is needed to support the observations. Policy changes and funding availability largely determined the level and nature of rehabilitation. Efforts by all sectors have been declining in the last decade due to unstable policies, and inadequate funding and incentives.

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Annex 1. Summary of rehabilitation in classified forest lands¹⁰ over time

Period Data Elements	Colonial Period (1910-1945)	Post-war government-initiated rehabilitation (1946-mid 1970s)	Multi-sectoral rehabilitation efforts (mid 1970s-present)
Number of projects	35	More than 90 projects including those established before the war	<ul style="list-style-type: none"> • 503 CBFM (mostly involved in reforestation) • Around 2200 private initiatives • Undetermined number of DENR regular and special projects • NGO (no data) • LGU (no data) • OGA (no data)
Project sizes	378 ha to 2696 ha	312 to 38,074 ha	< 1 to 4000 ha
Agencies	Government (School of Forestry in Los Baños, Laguna; Bureau of Forestry)	Government (Reforestation Administration, Bureau of Forestry or Bureau of Forest Development)	DENR; private individuals/corporations (TLAs, TFs, IFMAs, SIFMAs); community/POs; OGAs, NGOs, LGUs, citizens
Major driving forces/objectives	<ul style="list-style-type: none"> • Scientific inquiry (trials, studies on seed treatment and suitable species) • Environmental (reforest barren lands, address flooding and soil erosion problems, promote water conservation) 	<ul style="list-style-type: none"> • Environmental (reforest barren lands and address flood and soil erosion problems) • Timber supply due to imminent shortage 	<ul style="list-style-type: none"> • Environmental • Imminent timber shortage (supply of industrial timber and fuelwood) • Socio-economic (provide livelihood opportunities, alleviate poverty)
Beneficiaries	Society in general (for environmental protection)	Society in general (for environmental protection), wood industries	Local communities, private sector, NGOs, LGUs and general public
General distribution	26 sites in Luzon, 6 in Visayas, and 3 in Mindanao	In 1972: 46 projects in Luzon, 31 in Visayas and 14 in Mindanao (cumulative from 1916)	All regions

¹⁰ Exceptions include citizen's planting in private lands under P.D. 1153 from 1977 to 1987 and some registered planting on private lands up to a maximum of 72,393 ha.

Period Data Elements	Colonial Period (1910-1945)	Post-war government-initiated rehabilitation (1946-mid 1970s)	Multi-sectoral rehabilitation efforts (mid 1970s-present)
Target area /project coverage (ha)	535,000 ha	166,877 ha (1948-1960) (Orden 1960)	<ul style="list-style-type: none"> • 6.5 million ha – long-term target of NFP • 1.4 million ha (FSP target from 1987-2000) • Many others (examples: Philippine German Cebu Upland Project 25,517 ha; Southern Mindanao Integrated Coastal Zone Management Project 9210 ha)
Area planted (ha)	26,660 ha (1910 to 1941) (Orden 1960)	17,390 ha (1948 to 1960) (Orden 1960) 132,993 ha (1961-74) (DENR data)	1,597,472 ha (1975 to 2002) (DENR data) <ul style="list-style-type: none"> • DENR 920,962 ha (1975-2002 –includes FSP) • LGU/OGA 100,485 ha • NG tenurial instruments 503,632 ha (410,112 TLA; 80,766 ITP/ TF/ AFF/ IFMA; SIFMA 3347) • Other private planting 72,393 ha
Major funding sources	Government appropriations	Government appropriations, Republic Act 115 (from concessions harvesting timber)	<ul style="list-style-type: none"> • Loans and Grants: ADB, World Bank, OECF, JBIC, USAID, Ford, KfW/GTZ, IFAD, ITTO • Government appropriations • Private sector self funding
Total costs	P3.574 million recorded disbursements from 1916 to 1941 (Orden 1960)	P16.693 million recorded disbursements from 1947 to 1960 (Orden 1960)	<ul style="list-style-type: none"> • FSP I: US\$283 million (ADB, OECF, GOP) • US\$101 million (World Bank) • FSP II: US\$139.27 m (ADB, JBIC, GOP) • The Magdugao agroforestry project: US\$0.07 million (USAID, DENR) • Philippine German community forestry project, Quirino: US\$8.589 million (GTZ, KfW, GOP) • ITTO CBFM: US\$957,135 (ITTO, GOP) • Cordillera Highland Agricultural Resources Management Project Reforestation Component: US\$4.66 million (IFAD, ADB, GOP) • Southern Mindanao Integrated Coastal Zone Management Project: US\$23.11 million (JBIC, GOP) • Many others

Period	Colonial Period (1910-1945)	Post-war government-initiated rehabilitation (1946-mid 1970s)	Multi-sectoral rehabilitation efforts (mid 1970s-present)
Data Elements			
Planned/actual cost per ha	P134/ha actual cost	P581/ha actual cost for 1947-60	P 20,140.06, P 24,000, P 43,145 (Planned costs for FSP based on Memo Circulars 1988, 1990 and 2000 for 3-year periods of plantation establishment, protection and maintenance) Actual reforestation cost P16,423.77 per hectare for FSP from 1987-2001
Durations	Continuing	Continuing	<ul style="list-style-type: none"> Contract reforestation (FSP I): 3 year contract period Other DENR, OGA, LGU, PO, private sector efforts: continuing depending on fund availability (the last two with tenurial instruments after 1996) NGO efforts – generally no clear arrangements after project ends
Tenure status	Planted areas were considered as “government land”	Planted areas were considered as “government land”	CBFMA, IFMA, SIFMA, Agroforestry Farm Lease Agreement, Tree Farm Lease Agreement, Certificate of Stewardship Contract, Forest Land Management Agreement, TLA
Methods of revegetation	Trials, small plantations	Plantations	Plantations and agroforestry are most important in terms of coverage and economic benefits to communities. Some assisted natural regeneration and enrichment planting.
Species planted	600 species in silvicultural trials; species both exotic and native (such as molave, narra, supra, para rubber, taluto, kalantas, malaruhat, teak, mahogany, ipil, lumbang, banaba, agoho, bitaog, baguiliumbang, akle, tindalo, ipil-ipil and kakawate)	Combination of native and exotic species; native relatively more important <i>Cinchona spp.</i> , mahogany, <i>Alnus spp.</i> , benguet pine (<i>Pinus insularis</i>), rain tree (<i>Saranea saman</i>), talisai (<i>Terminalia catappa</i>), narra, akleng parang (<i>Albizia procera</i>), teak, almaciga (<i>Agathis philippinensis</i>), agoho, bamban (<i>Donax cannaeformis</i>)	<ul style="list-style-type: none"> About 80% exotic species (mainly mahogany, <i>Acacia mangium</i>, <i>A. auriculiformis</i>, <i>Eucalyptus</i> and <i>Gmelina arborea</i>) Native [narra, malapapaya (<i>Polyscias nodosa</i>) and others]

Period Data Elements	Colonial Period (1910-1945)	Post-war government-initiated rehabilitation (1946-mid 1970s)	Multi-sectoral rehabilitation efforts (mid 1970s-present)
Percent survival	15% due to war outbreak	No data available	<ul style="list-style-type: none"> • 29.61 to 86.76% for FSP I as of 2003 • 59 to 93.48% for FSP II as of 2003 • Average 71% for FSP (FMB records)
Strategies and socio-economic incentives	<ul style="list-style-type: none"> • Hired labour to reforest • Squatters evicted from area 	<ul style="list-style-type: none"> • Hired labour to reforest • Occupants evicted from area 	<ul style="list-style-type: none"> • Local communities seen as partners in forest development and protection • Provision of tenure instruments starting in the early 1980s • Provision of enhanced livelihood options • Harvest-sharing arrangements
Success/sustainability	<ul style="list-style-type: none"> • Plantations destroyed by war • Inadequate funding contributed to limited accomplishments 	<ul style="list-style-type: none"> • Inadequate funding, technical inefficiencies and graft and corruption affected the government-managed projects 	<ul style="list-style-type: none"> • FSP I: Some communities burn forest plantations and reclaim their former agricultural lands. Limited species choice - exotic monocultures, pests & diseases, bio-invasion. Family approach most successful. • FSP II: Provision of tenure rights & livelihood options, participatory approaches, devolution of forest rehabilitation and management rights to local communities contributes to success in some CBFM cases. Limited participation in others. Logging bans have negative impacts. • Involvement of corporate, private individual, NGO, OGA and LGU sectors in rehabilitation with some promising innovative experiences. Private sector initiatives are declining due to lack of incentives and unstable policies. • Graft and corruption mar efforts. Difficult to pay back FSP loans. Frequent policy changes hamper timber harvesting.